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ABSTRACT OF THE DISCLOSURE

First, an operator sequentially teaches the start point A, the end point F and junction points B, C, D, E on the welding path by moving the torch head by jog feed without paying attention to the torch orientation. Next, a reference plane to define the orientation of the torch is specified, and an inclination angle and a forward angle representing the torch orientation be inputted into a robot controller. On the basis of these inputted angle data and the taught data, a basic welding orientation is automatically calculated. Further auxiliary points are set around the junction points B through E each forming corner parts connecting straight lines; tool vectors which may give a smooth torch orientation change through the corner parts are automatically calculated for the auxiliary points and the junction points; and on the basis of the results, a welding program is produced. Among elements which determine the torch orientation, an element relating to the rotation around the torch axis reflects the state at the time of teaching of points A to E.